

ABSTRACT

An apparatus and method for uniformly sharing across a plurality of channel signals FEC coding gain which may be achieved through FEC encoding of a higher baud rate electrical data signal or through multiplexed or combined electrical data signals from multiple data sources prior to their subsequent demultiplexing and separate generation into optical channel signals which are multiplexed and launched onto an optical transmission medium. The optical signal generation is achieved through reverse multiplexing of the higher baud rate data signal or of the multiplexed, FEC encoded plural data signals. Effectively, the coding gain power of the FEC encoder is spread over all the signal channels so that each channel can potentially benefit from performance above the average coding gain thereby increasing the coding gain of the worst noise signal channel and correspondingly reducing its BER at the receiver so that, now, the combined multiple channel signals may be propagated further along the optical transmission medium before signal interception is required, such as required channel signal regeneration (3R). By coding gain averaging, the coding gain is taken from the lesser noise affected channels and spread over all the channels so the higher noised ridden channels obtain an effective increase in coding gain which corresponds to a higher reduction in BER at the optical receiver terminal.